Science and Technology Enable Quick, Comprehensive Personality Disorder Assessment: The CAT-PD Project

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"an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual’s culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment."

(APA, 1994, 2000)
# DSM-IV Personality Disorders

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Personality Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Odd / Eccentric</td>
<td>Paranoid, Schizoid, Schizotypal</td>
</tr>
<tr>
<td>B: Dramatic / Emotional</td>
<td>Antisocial, Borderline, Histrionic, Narcissistic</td>
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<tr>
<td>C: Anxious / Fearful</td>
<td>Avoidant, Dependent, Obsessive-Compulsive</td>
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<tr>
<td>Appendix Diagnoses</td>
<td>Passive-Aggressive, Depressive</td>
</tr>
</tbody>
</table>
Prevalence of PD is approx. 10% in the general U.S. population and as high as 50% in psychiatric settings.

PD is associated with:

- significant interpersonal impairment
- increased utilization of health care services
- increased self-injury and suicidality
- attenuated responses to many treatments

Thus, assessment and treatment of personality pathology is important in applied and research settings.
Problems with the Current System

- Excessive comorbidity
- Within-diagnosis heterogeneity
- Poor coverage of PD symptomatology
- Low stability of categorical PD diagnoses
- Poor convergent validity across measures
- Limited support for latent categorical models of PD
Proposed DSM-5 Definition of PD

(DSM-5 website, July 2011)

A. Impairment in self or interpersonal functioning.

B. Core maladaptive personality traits.

C/D/E. Stable across time; Not better understood as a cultural norm; Not due to effects of substance or medical condition.

BUT.... APA failed to support this new system. PDs in DSM-5 will be described identically to DSM-IV. More research needed.
Two Types of Dimensional Systems

Measure existing PDs along continua:
- still leads to problems with diagnostic overlap, convergent validity, heterogeneity, etc...

Measure traits underlying the PDs:
- the trait-dimensional approach
# SNAP Correlations with SIDP-IV PD Ratings

<table>
<thead>
<tr>
<th>Scale</th>
<th>PAR</th>
<th>SZD</th>
<th>STP</th>
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Note.  N = 94.  All rs > .26 are sig., p < .01.  All scores are dimensional.  *Highest correlation per PD.*  Clark, Simms, Wu, & Casillas (in press)
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Trait-Dimensional Approaches

Based on 50+ years of evidence from the “normal” and “abnormal” personality literatures.

Fundamental dimensions underlying PDs are personality traits.

Traits are building blocks we can use to formulate PDs empirically.

Trait structure is hierarchical... e.g., Big 2, 3, 4, 5, 6, 7, +
How Trait-Dimensional Models Help

<table>
<thead>
<tr>
<th>Question</th>
<th>Help</th>
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<tr>
<td>Comorbidity?</td>
<td>PDs overlap due to common traits</td>
</tr>
<tr>
<td>Heterogeneity?</td>
<td>Dimensional scales are homogenous</td>
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<tr>
<td>Poor coverage?</td>
<td>Trait systems are more comprehensive</td>
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<tr>
<td>Poor reliability?</td>
<td>Better alphas and temporal stability</td>
</tr>
<tr>
<td>Poor validity?</td>
<td>Cleaner patterns of covariation</td>
</tr>
<tr>
<td>Categories?</td>
<td>No such assumption made</td>
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</tbody>
</table>
But... Which Personality Traits?

Prominent trait-dimensional measure exemplars:
- NEO Personality Inventory-Revised (NEO PI-R)
- Schedule for Nonadaptive and Adaptive Personality (SNAP)
- Dimensional Assessment of Personality Pathology (DAPP)

A large literature has emerged showing the links between these trait systems and personality disorder.

But none is comprehensive; and efficiency is a concern.
Widiger & Simonsen (2005, 2006) reviewed 18 trait approaches, organized into the FFM... 100+ possible traits!

DSM-5 workgroup: 37 traits initially, but 25 now...
- Personality Inventory for DSM-5 (PID-5; Krueger et al., 2011)
- Problems with inputs and methods led to an incomplete model.

More consensus for the higher order domains than for the lower order facets.
Summary of Possible Lower-Order Dimensions


**Extraversion vs. Introversion:** activity, aloofness, assertiveness, detachment, entitlement, excitement seeking, exhibitionism, exploratory excitability, extravagance, gregariousness, histrionic sexualization, intimacy problems, optimism, positive emotionality, restricted expression, schizoid orientation, shyness, sociability, social avoidance, social closeness, social potency, stimulus seeking, warmth, well-being

**Antagonism vs. Compliance:** aggression, agreeableness, alienation, altruism, attachment, callousness, compassion, compliance, conduct problems, dependency, diffidence, empathy, entitlement, helpfulness, insecure attachment, interpersonal disesteem, manipulativeness, mistrust, modesty, narcissism, passive oppositionality, psychopathy, pure-hearted, rejection, sentimentality, social acceptance, social closeness, straightforwardness, submissiveness, suspiciousness, tender-mindedness, trust

**Constraint vs. Impulsivity:** achievement-striving, childishness, competence, compulsivity, conscientiousness, deliberation, disorderliness, dutifulness, eagerness of effort, harm avoidance, impulsivity, irresponsibility, obsessionality, order, perfectionism, propriety, resourcefulness, responsibility, risk taking, self-discipline, traditionalism, workaholism

**Emotional Dysregulation vs. Stability:** affective lability, alienation, angry hostility, anticipatory worry, anxiousness, dependency, depressiveness, dysphoria, emotional dysregulation, fear of uncertainty, hostility, hypochondriasis, identify problems, inferiority, introspection, irritability, negative affect, pessimism, self-acceptance, self-consciousness, self-harm, sensitivity, stress reaction, unhappiness, vulnerability, worthlessness

**Unconventionality / Oddity / Openness:** absorption, dissociation, eccentric perceptions, eccentricity, openness to experience, perceptual cognitive distortion, rigidity, spiritual acceptance, thought disorder, transpersonal identification
Categorical models of PD have problems, many of which are ameliorated by trait-dimensional systems.

DSM-5 will include an experimental trait-based PD system, but more research is needed on this system.

Many dimensional systems exist... How are we to integrate?

No single model/measure includes everything.

Many trait measures are long and impractical in both research & applied settings...
The CAT-PD Project

Primary goals of the CAT-PD project:

Develop an integrative and comprehensive model and efficient measure of PD traits.
Summary of Research Plan

Phase 1: Develop constructs & initial item pool

Phase 2: Data collection and structural analyses
- 2a: 1,000+ community adults
- 2b: 600+ current or recent psychiatric patients

Phase 3: IRT calibration & CAT simulations

Phase 4: CAT-PD software development

Phase 5: Live testing study / Practical utility
- Additional sample of 300 psychiatric patients
Defining CAT-PD Traits/Items
Simms, Goldberg, Roberts, Watson, Welte, & Rotterman (2011)

Started with Widiger & Simonsen’s (2005, 2006) list, which was rationally sorted, operationally defined, and reviewed by 28 international PD experts.

Resulted in 59 candidate traits, organized by FFM/PSY-5

Most items are based on Goldberg’s *International Personality Item Pool (IPIP)*, rationally sorted into domains & trait bins by 11 trained research assistants.

New items written by CAT-PD team to cover the extreme PD-relevant poles of each trait dimension.

Initial item pool included 2,589 items for the first phase of data collection:
- 1,570 IPIP items; 1,019 new items.
- Average of 44 items per candidate trait.
59 Candidate Trait Dimensions

**Neg. Emotionality**
- Stress Reactivity
- Affective Lability
- Anxious Apprehension
- Fearfulness
- Depressive Dysphoria
- Shame/Guilt
- Low Self-Esteem
- Self-harm
- Suicidality
- Submissiveness
- Exploitability
- Rejection Sensitivity
- Jealousy
- Hypochondriasis

**Positive Emotionality**
- Activity/Energy
- Anhedonia
- Optimism vs. Pessimism
- Exhibitionism
- Seductiveness
- Dramaticism
- Entitlement
- Arrogance
- Emotional Detachment
- Social Avoidance
- Social Aloofness
- Romantic Disinterest

**(Dis)Constraint**
- Urgency
- Lack of Premeditation
- Lack of Perseverance
- Lack of Concern for Consequences
- Risk-taking / Recklessness
- Excitement Seeking
- Rigid Propriety
- Rebellious Nonconformity
- Perfectionism
- Excessive Achievement Striving
- Orderliness
- Undependability

**Antagonism**
- Callousness
- Manipulativeness
- Domineering
- Depravity
- Conduct Problems
- Aggression
- Anger / Irritability
- Hostility
- Blame Externalization
- Deceitfulness
- Oppositionality
- Selfishness
- Social Insensitivity

**Oddity**
- Magical Thinking
- Perceptual Aberrations
- Cognitive Dysregulation
- Obliviousness
- Absorption
- Peculiarity / Oddity
- Suspiciousness
- Cynicism
Two Rounds of Data Collection

Community study:
- Ps primarily recruited using random-digit dialing (RDD).
- Supplemented by targeted flyers, ads, & university.
- Goal: FAs to hone initial constructs and build preliminary scales.

Patient study:
- Ps were current or recent psychiatric clients/patients.
- Recruited using flyers in mental health clinics.
- Goal: Cross-validation and further honing into final scales.

Balanced incomplete block design (BIBD) to deal with large number of items...
### Balanced Incomplete Block Design

<table>
<thead>
<tr>
<th>Booklet</th>
<th>Items</th>
<th>Blocks of Trait Bins</th>
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# Community Sample Characteristics

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<td>N</td>
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<tr>
<td>Sex</td>
<td>50.3% female</td>
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<tr>
<td>Race</td>
<td>59% White; 21% Asian; 18% Black; 1% Native American</td>
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<tr>
<td>Hispanic</td>
<td>5%</td>
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<tr>
<td>Age</td>
<td>M = 48 (±17.0); range = 18-87</td>
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<tr>
<td>Rel. Status</td>
<td>27% married; 14% div/sep/wid; 54% never married</td>
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<tr>
<td>Highest Degree</td>
<td>42% high school; 27% BA/BS; 10% graduate degree</td>
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<tr>
<td>Urban-Rural</td>
<td>53% urban; 42% suburban; 5% rural</td>
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## Patient Sample Characteristics

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<td>Ns/Block</td>
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<td>Sex</td>
<td>63.6% female</td>
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<tr>
<td>Race</td>
<td>63% White; 34% Black; 2% Native American; 1% other</td>
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<tr>
<td>Hispanic</td>
<td>5%</td>
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<tr>
<td>Age</td>
<td>M = 43 (±12.5); range = 18-77</td>
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<tr>
<td>Rel. Status</td>
<td>18% married; 31% no longer married; 50% never married</td>
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<tr>
<td>Highest Degree</td>
<td>39% high school; 21% BA/BS; 8% graduate degree</td>
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<td>59% urban; 33% suburban; 7% rural</td>
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Block Design yielded ~400 Ps and 200 Ps for within-block analyses in community and patient samples, respectively.

FAs were iteratively conducted at the item level, based on matrices of polychoric correlations.

Most FAs completed within blocks to maximize N. Some cross-block FAs to hone targeted scales.

Today: Summary of the final CAT-PD scales...
Negative Emotionality

**INITIAL TRAITS**
- Stress Reactivity
- Affective Lability
- Anxious Apprehension
- Fearfulness
- Depressive Dysphoria
- Shame/Guilt
- Low Self-Esteem/Pessimism
- Non-suicidal Self-injury
- Suicidality
- Submissiveness
- Exploitability
- Rejection Sensitivity
- Jealousy
- Hypochondriasis

**CAT-PD**
- Affective Lability
- Anxiousness
- Depressiveness
- Self-harm
- Submissiveness
- Relationship Insecurity
- Health Anxiety

**PROPOSED DSM-5**
- Emotional Lability
- Anxiousness
- Depressivity
- Submissiveness
- Separation Insecurity
- ??????
# Positive Emotionality

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<th>INITIAL TRAITS</th>
<th>CAT-PD</th>
<th>PROPOSED DSM-5</th>
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<tr>
<td>Anhedonia</td>
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<td>Attention Seeking</td>
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<td>Exhibitionism</td>
<td>Grandiosity</td>
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<td>Seductiveness</td>
<td>Social Withdrawal</td>
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<td>Dramaticism</td>
<td>Emotional Detachment</td>
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<td>Romantic Disinterest</td>
<td>Intimacy Avoidance</td>
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### (Dis)Constraint

<table>
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<tr>
<th>INITIAL TRAITS</th>
<th>CAT-PD</th>
<th>PROPOSED DSM-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency</td>
<td>(to Affective Lability)</td>
<td>Impulsivity</td>
</tr>
<tr>
<td>Lack of Premeditation</td>
<td>Non-Premeditation</td>
<td>Perseveration</td>
</tr>
<tr>
<td>Lack of Concern for Consequences</td>
<td>Non-Perseverance</td>
<td>(Distractibility?)</td>
</tr>
<tr>
<td>Lack of Perseverance</td>
<td>Risk Taking</td>
<td>Risk-taking</td>
</tr>
<tr>
<td>Risk-taking / Recklessness</td>
<td>Perfectionism</td>
<td>Rigid Perfectionism</td>
</tr>
<tr>
<td>Excitement Seeking</td>
<td>Orderliness</td>
<td>Irresponsibility</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>Undependability</td>
<td>??????</td>
</tr>
<tr>
<td>Orderliness</td>
<td>Excessive Achievement Striving</td>
<td>??????</td>
</tr>
<tr>
<td>Undependability</td>
<td>Rigid Propriety</td>
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<td>Excessive Achievement Striving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rigid Propriety</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Antagonism

INITIAL TRAITS
- Callousness
- Selfishness
- Manipulativeness
- Deceitfulness
- Blame Externalization
- Domineering
- Conduct Problems
- Depravity
- Oppositionality
- Rebellious Nonconformity
- Aggression
- Hostility
- Anger / Irritability
- Social Insensitivity

CAT-PD
- Callousness
- Manipulativeness
- Domineering
- Norm Violation
- Hostile Aggression
- Anger
- Rudeness

PROPOSED DSM-5
- Callousness
- Deceitfulness
- Manipulativeness
- Hostility
- ????
- ????
- ????
- ????

Tuesday, May 7, 13
## Oddity

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<tbody>
<tr>
<td>Magical thinking</td>
<td>Unusual Beliefs</td>
<td>Unusual Beliefs &amp; Experiences</td>
</tr>
<tr>
<td>Perceptual Aberrations</td>
<td>Unusual Experiences</td>
<td>Perceptual Dysregulation</td>
</tr>
</tbody>
</table>
| Cognitive Dysregulation     | Cognitive Problems                  | ????
| Obliviousness               | Fantasy Proneness                   | ????
| Absorption                  | Peculiarity                          | Eccentricity                       |
| Peculiarity                 | Mistrust                             | Suspiciousness                     |
| Suspiciousness              |                                     |                                    |
| Cynicism                    |                                     |                                    |

Tuesday, May 7, 13
Summary of Research Plan

Phase 1: Develop constructs & initial item pool

Phase 2: Data collection and structural analyses
- 2a: 1,000+ community adults
- 2b: 600+ current or recent psychiatric patients

Phase 3: IRT calibration & CAT simulations

Phase 4: CAT-PD software development

Phase 5: Live testing study / Practical utility
- Additional sample of 300 psychiatric patients
Computerized Adaptive Testing (CAT)

- Tests tailored to individuals.
- Administers only items that provide optimal information given person’s trait level.
- Built on a strong foundation of Item Response Theory (IRT)
- Marked efficiency over P&P tests, with little or no cost to measurement precision & validity.
- Being implemented in CAT-PD measure to facilitate more efficient measurement of all traits (under development).
Typical CAT Algorithm

1. Administer Item of Median Severity
2. Estimate Trait Level
3. Assess Termination Rule
   - YES: Terminate Scale Administration
   - NO: Maximum Information Item Selection
IRT Item Information Curves

Information

Trait Level ($\theta$)

Tuesday, May 7, 13
IRT, CAT, & Personality

IRT-based CATs starting to appear in the personality literature:

- Waller & Reise (1989): **MPQ**
- Kamakura & Balasubramanian (1989): **CPI**
- Reise & Henson (2000): **NEO PI-R**
- Waller (1999): **MMPI-2**
- Simms & Clark (2005): **SNAP/SNAP-2**

Only Simms & Clark (2005) tested a live personality/PD CAT.

None have yielded operational CATs for personality disorder.
CAT Time Savings
Simms & Clark (2005)

Minutes

Traditional Paper-and-Pencil: 30.7
Computerized Full-Scale: 20.6
Computerized Adaptive: 12.9
Trait-dimensional models of PD show clear advantages over the DSM-based categorical system.

Consensus is emerging on the higher-order PD trait domains, but much less is certain at the lower-order facet level.

We integrated across all prominent PD trait models and identified 59 candidate traits.

Community and Patient structural analyses honed that list to 33 final traits.
CAT will facilitate efficient & flexible measurement...

ETA Fall 2013... final validation study to come.

In the interim, we have developed a static form (CAT-PD-SF) measuring all 33 traits with 212 items (all alphas ≥ .80).

The final model/measure is in a strong position to inform the structure of PD traits and future DSM-5 based research.

Our results suggest the proposed DSM-5 trait model is incomplete.

  e.g., traits missing: self-harm, norm violation, health anxiety, workaholism, rigidity, domineering, anger, rudeness, cognitive problems, fantasy proneness.
Implications for Treatment & Research

Likely future changes to the DSM and the emergence of elaborated trait models will serve to de-emphasize traditional disorder-specific treatment approaches.

Trait-based PD models could/should lead to treatment plans targeting specific traits or trait profiles, rather than “disorders.”

Research into these trait-treatment relations is needed.

Cross-cutting “trans-diagnostic” dimensions are the future of funded psychiatric research (see NIMH’s RDoC Initiative).
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Project Coordinator
Jane Rotterman

Other Staff
Julie Gass
Stephanie Godleski
Aidan Wright

Lots of Research Assistants
Lots of Participants

Tuesday, May 7, 13
Thank you.

If you are interested in the CAT-PD measure, please contact me at ljsimms@buffalo.edu